

## Running Head: Perceptions of binge-drinking among undergraduates

Wide variation in understanding about what constitutes “binge drinking”

Wide variation in understanding about what constitutes “binge drinking”

Cooke, Richard<sup>1</sup>, French, David.P<sup>2</sup>, and Sniehotta, Falko<sup>3</sup>

<sup>1</sup> Psychology, School of Life & Health Sciences, Aston University, Birmingham, B4 7ET, UK, [r.cooke@aston.ac.uk](mailto:r.cooke@aston.ac.uk)

<sup>2</sup> Applied Research Centre in Health & Lifestyle Interventions, Coventry University, Whitefriars Building, Priory Street, Coventry, CV1 5FB, UK, [aa3767@coventry.ac.uk](mailto:aa3767@coventry.ac.uk)

<sup>3</sup> School of Psychology, College of Life Sciences & Medicine, William Guild Building, University of Aberdeen, Aberdeen, AB24 2UB, UK, [f.sniehotta@abdn.ac.uk](mailto:f.sniehotta@abdn.ac.uk)

Corresponding author Dr Richard Cooke: +(44) 121 204 4072

Key words: Alcohol, binge-drinking, sensible-drinking, guidelines, knowledge,

### Acknowledgments

We thank Johanna Gatz and Tracy Cooper for data collection on Study 1 and thank

David Reeve, Jenna Tye and Chris Yang for help with data collection in Study 2

### Abstract

Two studies investigated undergraduates' knowledge of UK government recommendations about binge-drinking and sensible drinking, and also examined how labelling oneself as a binge-drinker is associated with binge-drinking perceptions. In Study 1, 325 undergraduates reported how many units constitute binge-drinking, and labelled themselves as a "binge-drinker" or "non binge-drinker". Participants overestimated how many units constitute binge-drinking relative to UK government recommendations. Also, 59% labelled themselves as "non binge-drinkers" and gave significantly higher estimates compared with "binge-drinkers". In Study 2, 386 undergraduates defined binge-drinking and reported how many units constitute sensible drinking. Only 13% of undergraduates defined binge-drinking in terms of units of alcohol, and undergraduates overestimated how many units constitute sensible drinking. This research found wide variation in personal understanding of the term binge-drinking and suggests a review of how to communicate recommendations about alcohol consumption to young people is needed.

Key words: Alcohol, binge-drinking, sensible-drinking, guidelines, knowledge,

## Introduction

Binge drinking is a harmful pattern of drinking that is prevalent among young people and seems to be a distinctive characteristic of the British drinking culture (Parliamentary Office of Science and Technology, 2005). Younger people are particularly likely to engage in this pattern of drinking: men and women aged 16-24 report drinking similar amounts of alcohol to those aged 25-44, but are more likely to condense this drinking into fewer occasions (Lader & Goddard, 2006). There is growing evidence that binge drinking is behind the increase in deaths due to liver disease (NHS National Services Scotland, 2005).

Reducing binge drinking is part of the UK government's health promotion strategies in England and Wales (Cabinet Office, 2004) and Scotland (Scottish Executive, 2002). Progress towards this goal was evaluated in a recent government report (Department of Health, Home Office et al., 2007). This report reaffirmed the government's commitment to reducing binge-drinking by increasing young people's awareness of sensible drinking guidelines, to encourage informed choice regarding alcohol consumption.

In the United Kingdom, there are guidelines on "sensible" drinking which have the aim of reducing heavy alcohol intake on single occasions. Prior to 1995, these guidelines defined "sensible" drinking in terms of weekly intakes, i.e. 21 units for men and 14 units for women, where a unit is equivalent to 10 ml of pure ethanol. In 1995, partly in response to people "saving up" their units for one or two drinking sessions, the guidelines were revised in terms of sensible daily limits: 3-4 units for men and 2-3 units for women (Department of Health, 1995; Health Education Authority, 1996).

Binge drinking is commonly used to denote heavy drinking on a single occasion, although there is no standard definition according to the British Medical Association (BMA Board of Science, 2008). However, binge drinking has been operationalised by some as drinking half the recommended weekly units (7 units for females, 10 units for males, e.g. Norman et al., 2007) and by others as consuming more than twice the sensible daily guidelines, i.e. over 8 units for men and 6 units for women, in a single session (Prime Ministers Strategy Unit, 2003). In the present paper we will use the 6/8 definition because this the definition specified in the Prime Minister's Strategy group document, which prompted subsequent policy documents such as the National Alcohol Strategy (Cabinet Office, 2004).

It appears that there is a lack of awareness of sensible drinking guidelines, and they have had little apparent impact on behavior. A study of 263 people shopping in Scottish supermarkets found that fewer than 10% were aware of the recommended daily limits and fewer than half reported using units to monitor their personal consumption (Gill & O'May, 2006). In the UK as a whole, knowledge appears to be higher, with 86% of adults saying they had heard of measuring alcohol in units, although less than 15% could identify the recommended daily limits (Lader & Goddard, 2006).

Additionally there is concern that the frequency of binge drinking continues to rise, especially for young people (Lader & Goddard, 2006). This is one reason why understanding binge drinking among university undergraduates is important. Other reasons include the increase in the number of young people attending university and the high rates of binge drinking amongst this group: Cooke et al. (2007) and Norman et al. (2007) both found over 60% of undergraduates engaged in binge drinking (see Gill (2002) for a review of the literature on binge drinking rates in undergraduates). In

addition, despite being highly educated, knowledge of sensible drinking guidelines among university undergraduates may be poor. A study of 180 female Scottish university undergraduates found more than half of the undergraduates did not know the sensible guidelines for drinking and over half did not know the unit content of their favourite drink (Gill & O'May, 2007). While increased knowledge is unlikely to be sufficient to promote behaviour change, it is likely that knowledge of these guidelines is a necessary part of efforts to reduce binge drinking, because the absence of this knowledge would make it impossible for individuals to compare their behaviour to a standard to see how they are doing.

Given that the introduction of sensible drinking recommendations has been followed by a rise in alcohol consumption, it appears that introducing these recommendations has not directly impacted to reduce alcohol consumption. It is not clear, however, whether the rise is due to a lack of knowledge of these recommendations. Alternatively, it may be that people have adequate knowledge, but do not think of these guidelines as relevant, i.e. they conceptualise their alcohol consumption in terms other than these guidelines. Equally they may have knowledge but can't or don't act on it or have knowledge but choose not to act.

Research into knowledge of what constitutes binge drinking is limited. Gill and O'May (2007) found that female undergraduates generally overestimated the number of units in a binge-drinking session. In addition, Guise and Gill (2007) found that female undergraduates had low knowledge of how many units equates to binge-drinking. Another factor that may influence knowledge of what constitutes binge-drinking is whether or not people see themselves as a binge-drinker. Norman et al. (2007) found undergraduates who perceived themselves as similar to a prototypical

binge-drinker, had stronger motivation to binge-drink, than undergraduates who did not see themselves as similar to this prototype.

The present paper outlines two studies that provide information about undergraduates' perceptions of binge-drinking and sensible drinking. The aim is to investigate undergraduates' knowledge of binge-drinking and sensible drinking definitions. Study 1 focuses on undergraduates' perceptions of how many units of alcohol constitute binge-drinking, as well as testing the association of these perceptions with self-labelled binge-drinking status and gender. Study 2 examines how undergraduates define binge-drinking, as well as investigating knowledge about sensible drinking guidelines.

### Study 1 Method

#### Participants & Design

Three hundred twenty five undergraduates participated in this study (223 female, 102 male, 17-57 years,  $M = 20.11$ ,  $SD = 4.31$ ). One hundred seventy-seven undergraduates (102 female, 75 male, 138 year 1, 7 year 2, 10 year 3, 19 year 4, 3 year 5, 17-53 years,  $M = 20.28$ ,  $SD = 4.70$ ) at the University of Aberdeen, Scotland and 148 undergraduates (120 female, 28 male, 7 foundation year, 62 year 1, 71 year 2, 5 year 3, 3 year 4 18-57 years,  $M = 19.91$ ,  $SD = 3.81$ ) at Aston University, England completed the study. Participants at the University of Aberdeen were recruited during November and December 2005, while participants at Aston University completed measures during November and December 2006. Participants were exclusively recruited through research participation schemes run in the Psychology departments of the University of Aberdeen and Aston University. Therefore, all participants were psychology students.

#### Measures

Participants were asked to report their age, year of study and gender and were then presented with the following definitions:

A pint of ordinary strength lager (Carling Black Label, Fosters) = 2 units, A pint of strong lager (Stella Artois, Kronenbourg 1664) = 3 units, A pint of bitter (John Smith's, Boddingtons) = 2 units, A pint of ordinary strength cider (Dry Blackthorn, Strongbow) = 3 units, A 175ml glass of red or white wine = around 2 units, A shot, which is a pub measure of spirits, (includes mixed drinks, e.g. whisky cola) = 1 unit, An alcopop (e.g. Smirnoff Ice, Bacardi Breezer, WKD, Reef) = around 1.5 units). Participants were also told that **One unit** of alcohol is *half a pint of beer*, a *shot* or a *small glass of wine*.

Participants then answered three questions about their perceptions of binge-drinking, based on measures used by Lader & Godard (2006), 'Please write down how many units of alcohol constitutes a binge-drinking session for men/women' and 'Do you consider yourself to be a binge drinker? (yes/no)'. On the second page of the questionnaire, participants were asked about their binge-drinking in the past week 'How many days in the previous week did you drink 7 (female)/10(male) or more units?'

#### Procedure

The study received ethical approval from the University of Aberdeen and Aston University. All participants gave informed consent prior to taking part in the study. Participants were tested in seminar rooms (Aberdeen) and laboratory settings (Aston). This difference reflects different policies regarding participant recruitment at the two universities. Participants completed the measures, and then completed the remainder of the questionnaire, which measured other variables not discussed in this

paper. After completing the questionnaire participants were debriefed and received class credit for participating.

Prior to main analyses, we compared results for the three perception items in the English and the Scottish samples, to see if location affected results. There was only one difference due to location, with Scottish undergraduates more likely to label themselves as non binge-drinkers (64%) compared to participants from England (51%; Chi-Square (1,323) = 4.66,  $p < .05$ ). As a result, all analyses examining the effect of binge-drinking status were repeated with location as a covariate. This did not affect any of the results reported, so all analyses reported aggregate across location.

### Study 1 Results

#### Perceptions of binge-drinking

Participants generally overestimated how many units represent a binge-drinking session for men and women relative to UK government guidelines. For men, the mean number of estimated units was 12.70 (SD = 6.39). The distribution was positively skewed (Skew = 1.72). For women, the mean number of estimated units was 9.34 (SD = 5.01). The distribution was positively skewed (Skew = 1.85). The modal response for men was 10 units (N = 93), and 7 units for women (N = 65). 28 participants identified 8 units for men as being binge-drinking and 27 participants identified 6 units as being a binge-drinking session for women. In total, 75% of participants believed that binge-drinking was more than 8 units for men and more than 6 units for women (see Table 1). One hundred thirty four participants labelled themselves as “binge-drinkers” and 189 participants labelled themselves as “non binge-drinkers”.

Table 1 about here

#### Comparing “binge-drinkers” and “non binge-drinkers”



We wanted to see if participants who labelled themselves as a “binge-drinker” gave different estimates of how many units constitute binge-drinking compared with participants who labelled themselves as “non binge-drinkers”. “Non binge-drinkers” had significantly higher estimates for female binge-drinking units ( $\underline{M} = 9.84$ ) compared with “binge-drinkers” ( $\underline{M} = 8.71$ ;  $t(1, 317) = 1.98$ ,  $p < .05$ , Cohen d = 0.22) and gave higher estimates for male binge-drinking units ( $\underline{M} = 13.11$ ) compared with “binge-drinkers” ( $\underline{M} = 12.06$ ;  $p = 0.15$ , Cohen d = 0.17) though this difference was not significant.

We also wanted to see if differences in responses to the likelihood question between “non binge-drinkers” and “binge-drinkers” reflected binge-drinking behaviour; did participants who engaged in binge-drinking label themselves as a binge-drinker? To test this idea, we compared binge-drinking episodes in the past week for the two groups. Participants who labelled themselves as non binge-drinkers engaged in significantly fewer episodes of binge-drinking ( $M = 0.79$ ) compared to binge-drinkers ( $\underline{M} = 2.00$ ;  $t(1, 320) = 8.53$ ,  $p < .001$ , Cohen d = 0.98). However, Figure 1 shows that while 90% of binge-drinkers engaged in at least one episode of binge-drinking in the past week, 50% of non binge-drinkers also engaged in at least one episode of binge-drinking.

Figure 1 about here

#### Comparisons by gender

Female participants gave higher estimates of how many units constitutes binge-drinking for men (Female  $\underline{M} = 13.12$ ; Male  $\underline{M} = 11.84$ ;  $t(1, 322) = 1.91$ ,  $p = .06$ , Cohen d = 0.21) and women (Female  $\underline{M} = 9.73$ ; Male  $\underline{M} = 8.54$ ;  $t(1, 322) = 2.33$ ,  $p < .05$ , Cohen d = 0.26) compared with male participants. There were no significant

differences due to gender in labelling oneself as a “binge-drinker” or “non binge-drinker”.

### Study 1 Discussion

The main finding from Study 1 is that undergraduates overestimate how many units constitutes binge-drinking. Undergraduates did not know the UK Government definitions of binge-drinking. It seems that undergraduates’ estimates are nearer to definitions based on the (pre 1995) weekly recommendations, rather than daily guidelines. In addition, undergraduates who labelled themselves as “non binge-drinkers” gave more inaccurate estimates of how many units constitute binge-drinking and there was some discrepancy between undergraduates’ perceptions of their own binge-drinking status and their own behaviour. Finally, females gave higher estimates of binge-drinking than males.

### Study 2

The main aim of Study 2 was to investigate how undergraduates define binge-drinking. In addition, Study 2 examines undergraduates’ knowledge of sensible drinking, in particular awareness of daily drinking guidelines.

### Study 2 Method

#### Participants

A total of 453 undergraduate undergraduates were approached at various locations at the University of Birmingham, England campus in January 2006, of whom 386 (85%) agreed to participate (192 males, 194 females). Those who agreed were provided with written and verbal information about the study and completed a consent form, before completing the study questionnaire.

#### Measures

The first section of the questionnaire asked participants “which of the following best describes what you consider to be binge drinking? (please tick one)” and was followed by nine definitions (see Table 2) that were elicited and refined with an earlier convenience sample of 45 undergraduates.

The second section of the questionnaire was concerned with drinking behavior. Participants were asked (a) how much they had drunk the last time they went out in a drinking situation, (b) how much they expected to drink in the next week, and (c) how much they expected to drink that evening if they were to go out drinking. In each case, respondents indicated quantity by writing a number for each of five categories of alcoholic drinks, namely (i) pints of normal strength beer or lager (e.g. Fosters), (ii) pints of extra strength beer or lager (e.g. Stella Artois), (iii) single (25ml) pub shots of vodka or other spirits, (iv) bottles of alcopops (e.g. Reef), (v) small (125ml) glasses of wine.

The third section of the questionnaire was concerned with knowledge. Participants were asked how many units of alcohol they thought were contained in seven common alcoholic drinks. They were also asked to indicate what they thought the Government (Department of Health) recommended as sensible daily drinking limits for men and women, in terms of number of pints of normal strength lager or double shots of spirits.

#### Analysis

Responses to those questions estimating alcohol consumption were converted into numbers of units of alcohol by multiplying the numbers of drinks by the numbers of units in each type of drink: normal strength beer [2 units], extra strength beer [3 units], wine or spirits [1 unit], bottle of alcopop [1.5 units]. Comparisons of mean

expected consumption by self and same-sex undergraduates were made using repeated measures t-test.

## Study 2 Results

### How do undergraduates define “binge drinking”?

Respondents endorsed many different definitions of binge drinking. The option “not drinking regularly but drinking a lot when you do” was the most frequently endorsed (73 respondents). Only 47 participants (13% of responders) endorsed the definition based on units of alcohol, i.e. “drinking over the recommended number of units in one sitting”, making it the fourth most popular definition chosen.

Table 2 about here

### Knowledge of recommended limits based on units of alcohol

Male undergraduates gave a mean response of 5.16 units (SD=3.48) for the maximum daily limit for “sensible” drinking for males, and 3.33 units (SD = 2.68) for the daily limit for females. Female undergraduates gave a mean response of 5.68 units (SD = 4.17) for the maximum daily limit for males, and 3.59 units (SD = 2.66) for the daily limit for females. The most popular responses for both male and female undergraduates were 4 units for men (50% of males; 42% of females) and 2 units for women (41% of males; 40% of females).

Knowledge regarding the unit content of various drinks was generally good, with the mean estimates being generally close to the true value (see Table 3). Estimates were particularly good for a pint of normal strength beer and a shot of spirits, where over half of the sample gave the correct answer, and a glass of wine, where nearly half gave the correct answer. Over-estimates were common for the number of units in a glass of wine (50% responders) and a shot of spirits (43%

responders). By contrast, under-estimates were common for the number of units in a pint of Strongbow (85%) and pint of extra strength beer (62%). Both under-estimates and over-estimates were common for the bottles of alcopops: Reef and VK Ice.

Table 3 about here

### Correlates of drinking estimates

There was no significant association between estimates of what undergraduates' expected to drink that night if they were to go out drinking and what they thought the government recommendations on maximum limits for "sensible" drinking were (males  $r=-0.03$ ,  $n=190$ ,  $p=0.64$ ; females  $r=-0.00$ ,  $n=183$ ,  $p=0.99$ ).

### Study 2 Discussion

Study 2 clearly shows there is little consensus among English undergraduates about how they define binge-drinking, despite widespread use of the phrase. Further, less than 15% of our sample considered a definition in terms of units to be the best available. Knowledge of the number of units in alcoholic drinks was generally good. Crucially, self-reported alcohol consumption was considerably higher than sensible limits, and was not associated with estimates of governmental recommendations for sensible drinking for either male or female undergraduates.

### General Discussion

Across two studies we have shown that there is wide variation in knowledge of what constitutes binge-drinking among undergraduates at three universities in the UK. We also found that (i) self-labelled "non binge-drinkers" gave significantly higher estimates for binge-drinking compared to "binge-drinkers", (ii) females gave higher unit estimates for both binge-drinking and sensible drinking compared with males, (iii) undergraduates overestimated how many units count as sensible daily drinking

and (iv) there was no link between estimates of sensible drinking and self-reported drinking.

#### Perceptions of “binge-drinking”

The present paper found widespread variation in perceptions of what constitutes “binge-drinking” among undergraduates and supports previous research into undergraduates’ knowledge of binge-drinking (Gill & O’May, 2007; Guise & Gill, 2007). Study 1 found that undergraduates’ perceptions of binge-drinking limits are overestimates compared with government guidelines. Thus, one reason for the recent increase in binge-drinking (Lader & Goddard, 2006) could be that undergraduates are binge-drinking without realising they are doing so, because their personal definitions of binge-drinking are overestimates compared to governmental guidelines.

Study 2 shows that fewer than 15% of our sample considered a definition of “binge drinking” in terms of these units of alcohol to be the best available: there is a mismatch between knowledge of guidelines and how these undergraduates think about drinking. It is a cause for concern that the most popular definition of binge drinking endorsed was “not drinking regularly but drinking a lot when you do”. Those undergraduates who accept this definition may view heavy bouts of bingeing, supplemented by more frequent lighter drink as a safer pattern of consumption than bingeing with less frequent lighter drinking, which is not in accord with the epidemiological evidence (Babor et al, 2003).

#### Factors that affect perceptions of binge-drinking

Study 1 shows self-labelled “non binge-drinkers” gave significantly higher estimates of how many units constitute binge-drinking compared with self-labelled “binge-drinkers”. Because “non binge-drinkers” possess higher estimates about how

many units constitute binge-drinking, this may make them less likely to see messages about binge-drinking as relevant to them. This is a concern because 50% of people who labelled themselves as non binge-drinkers engaged in binge-drinking in the previous week. Existing research on perceptions of “binge-drinkers” has focused on perceptions of others, rather than perceptions of own drinking (e.g., Norman et al., 2007), so research is needed to discover how (and why) undergraduates label themselves as a “binge-drinker” or “non binge-drinker”.

Study 1 found that females gave higher estimates of binge-drinking limits compared with males. These results were not due to a difference in the proportion of female and male undergraduates labelling themselves as binge-drinkers or non binge-drinkers, but could reflect greater negative perceptions of binge-drinking, and binge-drinkers, among female undergraduates. Guise and Gill (2007) noted that female undergraduates often distanced themselves from binge-drinking. In addition, Study 2 showed that female undergraduates gave higher estimates for how many units constitute sensible drinking compared with male undergraduates. This suggests a need for further research to identify why female undergraduates give higher estimates for alcohol guidelines.

#### Perceptions of sensible drinking

Study 2 demonstrates that the mean responses for “sensible” drinking in one day were higher than the UK government’s recommendations of 3-4 units of alcohol for men and 2-3 for women, although the estimates were lower than the common definition of a “binge” as 8 units or 6 units in a single session. Thus, undergraduates seem to have got the gist of the recommendations, although they cannot recall the precise numbers of units. The knowledge levels shown in the present study are considerably higher than those of newly matriculated undergraduates in Scotland (Gill

& O'May, 2007). This may be due to the Scottish study surveying undergraduates who had just arrived at university, a large proportion of whom were 17 years of age and consequently below the legal age for purchasing alcohol. By contrast, our sample was obtained in England, where undergraduates are generally a year older on entry into university, and were surveyed in the second term of the academic year.

Study 2 also showed a lack of association between knowledge of “sensible” limits, and anticipated levels of drinking. This may relate to the dissociation between knowledge of governmental limits and how undergraduates prefer to define binge drinking. This finding is worrying given the importance UK government policy places on reducing binge-drinking by raising awareness of sensible drinking guidelines (Department of Health et al., 2007).

#### Implications and future directions

The present study provides several key implications that can be used by health educators, practitioners and policy makers. First, undergraduates' understanding of what constitutes binge-drinking is different from government definitions of binge-drinking: undergraduates overestimate how many units count as a ‘binge’ and the majority do not link units with bingeing.

This discrepancy highlights a clear problem with the use of sensible drinking guidelines to reduce alcohol consumption. One future course of action would be to produce a definition that is informed by young people's perspectives. Alternatively, health campaigns could try to increase awareness of sensible drinking limits by making the explicit definition of what constitutes binge-drinking a priority. Research that compares the impact of either strategy is urgently needed. If the results of this study are correct, it suggests that, the UK government's aim of reducing binge-drinking by raising awareness of units is falling at the first hurdle: there is little



awareness, so consequently little chance of this impacting on drinking behaviour (Department of Health et al., 2007).

Second, undergraduates seem to possess (some) insight into whether or not they are engaging in binge-drinking: over 90% of self-labelled “binge-drinkers” engaged in at least one episode of binge-drinking in the previous week, whereas 50% of self-labelled “non binge-drinkers” had not engaged in any episodes of binge-drinking. So, while undergraduates may not be able to define binge-drinking in units, most of those who binge-drink seem aware of the fact that their drinking exceeds “sensible” limits

Third, 50% of “non binge-drinkers” engaged in at least one episode of binge-drinking in the previous week. It would be interesting to discover why some undergraduates who binge-drink they label themselves as a “binge-drinker”, while others do not. This latter group are a serious concern as while their behaviour has obvious health consequences, messages targeted at them (as binge-drinkers) are likely to be ignored due a perceived lack of relevance. Research that taps into how young people develop knowledge about alcohol, binge-drinking and seeing themselves as a binge-drinker or non binge-drinker would add to existing literature and provide information to inform interventions.

Fourth, females give higher estimates of what constitutes binge-drinking than males. This is a worry because it suggests that females may be more likely to be unaware that they are binge-drinking, and this is especially concerning due to the lower limits on binge-drinking for females (6 units) compared to males (8 units). This difference could also reflect gender differences in drink preference. Females tend to drink wine more than males (Lader & Godard, 2006), and research has shown that

self-poured glasses of wine can contain twice as many units of alcohol as individuals perceive (Gill & O'May, 2007).

Finally, undergraduates' estimates of sensible drinking were closer to the government recommendations for sensible drinking than the guidelines for binge-drinking. This suggests that undergraduates differentiate between these two types of drinking behaviour, although they still overestimate sensible recommendations. Of greater concern was the lack of relationship between estimates for sensible drinking and actual drinking behaviour. This leads one to question the utility of the governments current strategy aimed at reducing binge-drinking.

### Limitations

There are several limitations in the present study. First, the study only sampled from three universities, which may limit its generalisability to undergraduates at other universities. However, we are confident that the findings are robust given that the results across universities were similar, and given the differences between the three universities in location, ethnic diversity, and status. Two of the universities were located in Central England, and the other located in the North East of Scotland, where binge-drinking rates tend to be higher. Aston University has a higher intake of Black and Ethnic Minority students relative to the other two universities. Second, in Study 1, because the item asking about binge-drinking status was asked after participants estimated binge-drinking for men and women, this could have affected participants' responses to this item. Participants who filled out high estimates for men and women may have used these estimates to decide if they were a binge-drinker or not. To see if the order of the items affects responses given, future research is needed that varies the order of the items. Third, because participants received course credit for participation in Study 1, this could bias the results reported, by attracting students who are more

positive about alcohol consumption. Examination of Figure 1 suggests that this is not the case as not all participants drank alcohol. Fourth, participants were psychology students, which limits the generalisability of the results. Fifth, participants were not shown pictures of standard drinks, which may have affected their responses. A final limitation is that we did not ask either sample of participants to define both binge-drinking and sensible drinking, so we are unsure how these definitions relate to each other. Future research is needed to test this issue.

In conclusion, undergraduates systematically overestimated how many units of alcohol constitutes binge-drinking and only a minority chose to define binge drinking by using units of alcohol. Thus, young people diverge from how the UK government defines binge-drinking. Interventions aimed at reducing the prevalence of UK binge-drinking behavior will need to address this gap between policy and young people's perceptions to be successful.

## References

- Babor T, Caetano P, Casswell S *et al.* *Alcohol: no ordinary commodity*. Oxford: Oxford University Press, 2003.
- BMA Board of Science (2008). *Alcohol Misuse: Tackling the UK epidemic*. London, UK, BMA.
- Cabinet Office. (2004). *Alcohol Harm and Reduction Strategy for England*. London, UK: Prime Minister's Strategy Unit, Cabinet Office.
- Department of Health (1995). *Sensible Drinking: the report of an inter-department working group*; London: Department of Health.
- Cooke, R., Sniehotta, F., & Schüz, B. (2007). Predicting binge-drinking behaviour using an extended TPB: Examining the impact of anticipated regret and descriptive norms. *Alcohol & Alcoholism*; 42; 84-91.
- Department of Health, Home Office, Department for Education & Skills, Office for Culture, Media & Sports. (2007). *Safe. Sensible. Social. The next steps in the National Alcohol Strategy*. London, UK.
- Gill J.S. (2002). Reported levels of alcohol consumption and binge drinking within the UK undergraduate student population over the last 25 years. *Alcohol and Alcoholism*; 37: 109-120.
- Gill, J.S. & O`May, F. (2006). People seem confused about sensible drinking messages. *British Medical Journal*; 332; 302-303.
- Gill, J.S. & O`May, F. (2007). How `sensible` is the UK Sensible Drinking message? Preliminary findings amongst newly matriculated female university undergraduates in Scotland. *Journal of Public Health*; 29; 13-16.

Gill, J.S. & O`May, F. (2007). Practical demonstration of personal daily consumption limits: A useful intervention tool to promote responsible drinking among UK adults? *Alcohol and Alcoholism*; 42; 436-441.

Guise, J.M.F., & Gill, J.S. (2007). 'Binge drinking? It's good, it's harmless fun': a discourse analysis of female undergraduate drinking in Scotland. *Health Education Research*, 22, 895-906.

Health Education Authority (1996). *Think about a drink: There's more to a drink than you think*. Health Education Authority, London.

Lader, D. & Goddard, E. *Drinking: adults' behaviour and knowledge in 2006*.

November 2006, Omnibus Survey Report number 31. London: Office for National Statistics. <http://www.statistics.gov.uk/cci/article.asp?ID=1688>.

NHS National Services Scotland (2005). *Alcohol Statistics Scotland 2005*. Edinburgh, Scotland, UK: ISD Scotland Publications.

Norman, P., Armitage, C.J., & Quigley, C. (2007). The theory of planned behaviour and binge drinking: Assessing the impact of binge drinker prototypes. *Addictive Behaviors*, 32, 1753-1768.

Parliamentary Office of Science and Technology (2005). *Binge Drinking and Public Health number*. Post note 244. London: Parliamentary Office of Science and Technology.

Prime Minister's Strategy Unit (2003) *Interim analytical report for the national alcohol harm reduction strategy*. London: Prime Minister's Strategy Unit

Scottish Executive (2002). Plan for action on alcohol problems.

<http://www.scotland.gov.uk/health/alcoholproblems>.

Table 1Table 1 Descriptives for binge-drinking items for men and women ( $N = 325$ )

	Male	Female
Mean units	12.70	9.34
SD units	6.39	5.01
Mode units	10	7
Number who gave correct answer based on daily guidelines	28 (9%)	27 (8%)
Number who overestimated based on daily guidelines	248 (76%)	244 (75%)
Number who underestimated based on daily guidelines	49 (15%)	54 (17%)

Note, this table summarises the results for male and female participants combined

Table 2

Frequencies of undergraduates who indicated that each of the definitions provided the best available description of binge drinking (n=386)

<b>Definition</b>	<b>Frequency</b>
Not drinking regularly but drinking a lot when you do	73
Drinking with the intention to get very drunk	65
Drinking a lot in a short space of time	58
<b>Drinking over the recommended number of units in one sitting</b>	<b>47</b>
Drinking without thought of the consequences	41
Going out with drinking being the main focus of the evening	32
Drinking past a safe limit	22
Drinking past the stage where you know you should stop	18
Drinking to lose control and lose your inhibitions	17
Ticked none or more than one response	13

Table 3

Summary of responses to questions about how many units of alcohol were in seven different drinks (n=386)

<b>Drink</b>	<b>Actual units</b>	<b>Mean</b>	<b>SD</b>	<b>mode</b>	<b>Number who gave correct answer</b>	<b>No response</b>	<b>Number of under estimates</b>	<b>Number of over estimates</b>
Pint of normal strength beer	2	1.85	0.65	2	211	16	131	28
Pint of extra strength beer	3	2.56	0.89	2	105	19	229	33
Shot of spirit	1	1.64	1.19	1	208	19	2	157
Bottle of reef	1.5	1.55	0.91	1	86	23	161	116
Pint of Strongbow	3	2.05	0.93	2	40	21	312	13
Glass of wine	1	1.59	0.91	1	179	20	3	184
Vodka ice	1.5	1.55	0.83	1	78	23	162	123



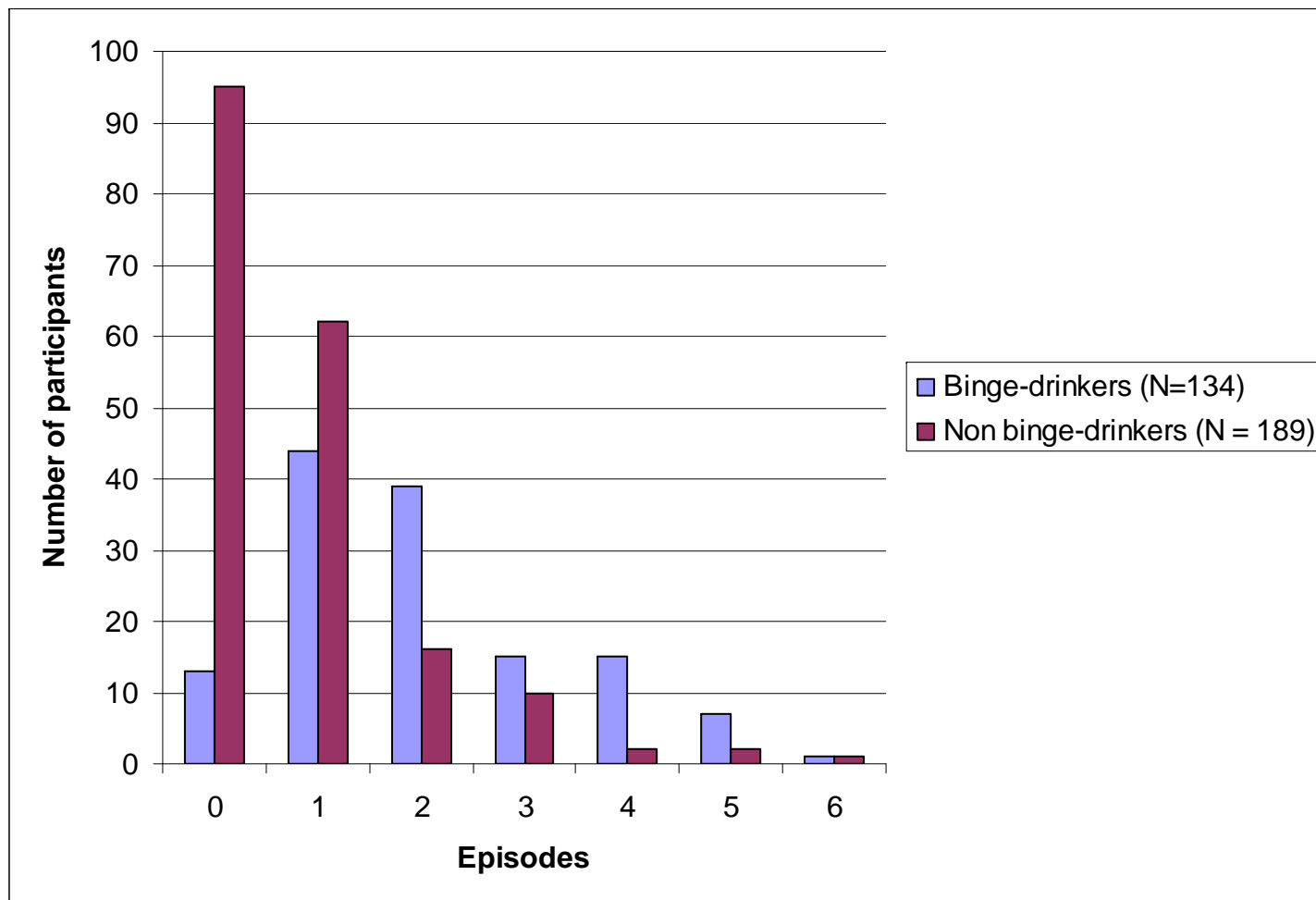


Figure 1. Episodes of binge-drinking in the past week for binge-drinkers and non binge-drinkers.